

## Climate Change as a Social Determinant of Health

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Social determinants of health (SDOHs), defined as the social circumstances in which people are born, grow, live, work, and play, profoundly affect children's health and drive health disparities.<sup>1</sup> SDOHs are shaped by the distribution of money, power, and resources at global, national, and local levels. The list of potential SDOHs is expansive and includes food insecurity, housing instability, violence exposure, structural racism, poverty, and immigration-related stressors. Addressing SDOHs within the pediatric medical home has garnered considerable interest lately as a potential solution to both improving health across the life course and mitigating health care costs.<sup>1</sup> However, one critical determinant is missing from the pediatric community's definition of SDOHs: climate change.

Climate change (also called global warming) is arguably one of the greatest public health threats of our time. Climate change is caused by rising greenhouse gas emissions from human activity, resulting in higher global average temperatures and changes to environmental and human systems. The American Academy of Pediatrics (AAP) issued a policy statement in 2007 (revised in 2015) encouraging pediatricians to reduce carbon emissions and support families experiencing the effects of climate change.<sup>2</sup> We agree with this call to action. However, given the current national focus of policymakers, funders, and health care systems on addressing SDOHs, along with the ubiquitous impact of the changing climate on the social and environmental circumstances in which children live, we recommend climate change be defined as a critical and often overlooked social determinant. Viewing climate change as an SDOH could potentially help coalesce a large group of ideologically different stakeholders around the common goals of decreasing health care costs and improving child health.

Similar to other SDOHs, climate change worsens health, increases health care costs, disproportionately impacts vulnerable communities, and exacerbates the effects of other SDOHs. Research has revealed that the changing climate, including longer and hotter summers, more frequent and intense storms, sea-level rise, more severe droughts, and poorer air quality, are inextricably linked to poorer health. The child health impacts are numerous and include worsening asthma and allergies; physical trauma from disasters; mental health symptoms, including posttraumatic stress disorder after disasters and anxiety about the future; increased



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exposure to infectious diseases; and lack of access to adequate food and clean water.<sup>2,3</sup> Projected costs of climate change to the health care system are staggering. The health costs (including premature deaths, hospitalizations, emergency department visits, and outpatient appointments) of 6 climate-related events from 2000 to 2009 was 14 billion dollars.<sup>4</sup> Therefore, addressing climate change could help control health care expenditures while simultaneously promoting child health and well-being.

Although climate change impacts everyone, children, communities of lower socioeconomic status, and communities of color will disproportionately experience negative health sequelae and have fewer available resources to adapt to the changing climate.<sup>2,5,6</sup> Poverty and climate change are interlinked because those experiencing poverty are more likely to be impacted by climate change, and climate change further exacerbates poverty.<sup>6</sup> However, comprehensive reports on addressing child poverty by both the National Academy of Medicine and the AAP do not mention climate change. Similarly, climate change threatens global food and water availability<sup>5</sup>; yet, to our knowledge, food insecurity interventions do not currently incorporate climate change. Framing climate change as an SDOH provides an opportunity to incorporate approaches to address both the unique health effects of climate change and its impact on other SDOHs.

### **STRATEGIES TO ADDRESS CLIMATE CHANGE AS AN SDOH**

Like we have done with other SDOHs, the pediatric community must consider ways to thoughtfully address climate change through medical education, clinical practice, community and scientific partnerships, and professional responsibility.

### **Medical Education**

Trainees and practicing pediatricians should learn about climate change, including the impact of the changing climate on child health and strategies to address patient and parent concerns about climate change. We argue that climate change education should be incorporated into existing SDOH curricula, which have been shown to be effective in improving medical trainees' knowledge about SDOHs, ability to identify patients experiencing social needs, and awareness of appropriate resources.<sup>7</sup>

### **Addressing Climate Change in Clinical Practice**

Discussing climate change during pediatric visits is within our scope of practice and recommended by the AAP.<sup>2</sup> The Yale Program on Climate Change Communication revealed that 77% of US adults believe schools should teach climate change; thus, it is likely parents feel similarly about pediatricians. However, no data exist on addressing climate change during pediatric visits. Further research should explore the perspectives of parents and pediatric providers on the importance of discussing climate change during visits, which topics would be the most meaningful to address, and barriers and facilitators to climate change discussions.

Screening for SDOHs is less meaningful without tangible resources for families. Although climate change has profound impacts on child health, providing resources in clinical settings may be challenging. In this regard, climate change is different from other SDOHs (eg, food insecurity) for which a referral to a clinic or community-based resource (eg, a food pantry) may have an immediate impact. Additionally, some components of addressing climate change (eg, reducing carbon emissions) may be best accomplished on a policy level. That being said, pediatricians can help educate about disaster

preparedness and provide referrals to families impacted by climate change. The pediatric community should also familiarize itself with actions individuals, families, and communities can take to both decrease carbon emissions and reduce the health impacts of climate change and incorporate these recommendations during routine anticipatory guidance. Pediatric providers may also consider having developmentally appropriate materials available to support parents who are trying to talk with their children about climate change. Finally, providers must be aware of how climate change impacts other SDOHs to effectively address a range of unmet social needs.

### **Community and Scientific Partnerships**

To comprehensively and effectively address other SDOHs, pediatric providers have begun to work in multidisciplinary teams. For example, to support families experiencing violence in the home, health care providers have partnered with hospital and community-based intimate-partner violence advocates. Similarly, the pediatric community needs to collaborate with climate scientists, clean energy leaders, community-based organizations, and behavioral health specialists with expertise in environmental-related mental health. Pediatricians should also work with policymakers to advocate for legislative policies aimed at reducing carbon emissions, just as we have done for policies about other SDOHs, immigration, and the social safety net.

### **Professional Responsibility**

The US health care system is responsible for 10% of the US greenhouse gas emissions, and hospitals are the second-most energy intensive commercial buildings.<sup>8</sup> The patient-centered medical home may itself lead by example in adopting climate-friendly practices, an action

similar to the ownership clinics have taken over other SDOHs. The pediatric community should also consider its own carbon footprint, both individually and as a profession. For example, traveling by air creates a heavy carbon footprint; it may be worth considering a professional commitment to choosing alternative means of transportation for attending conferences or using Web-based platforms. Our profession must take responsibility for our actions and work together as leaders to reduce carbon emissions.

## CONCLUSIONS

We call on the pediatric health care community to view the changing climate as a critical SDOH that both increases costs of care and negatively impacts child health locally and globally. From that vantage point, we urgently need to integrate climate change work into all facets of our professional lives to further health equity and promote child well-being.

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## ABBREVIATIONS

AAP: American Academy of Pediatrics  
SDOH: social determinant of health

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